Automatic Harvested Crop Protection System with GSM and Rain Detector

Sathvik[1], Vishal V Rane[2], Abubakkar siddiq [3], Jaison D'Souza[4]
Department of Electrical and Electronics Engineering
Benjanapadavu, Bantwal Taluk Mangaluru - 574219 Karnataka, India
(Affiliated to VTU Belagavi)

Under the Guidance of
Prathibha M
Department of Electrical and Electronics Engineering

***Abstract*— Nowadays, during the rainy seasons the cultivated crops gets affected due to the heavy rain fall. The main theme of this project is to prevent the crops from the heavy rain and also save the rain water. The rain sensor is used for the working of automatic roof. This system involves protecting the crops by the auto roof which covers the whole area were the crop is spread.**

Keywords— *Arduino, GSM, DC motors, Rain sensor, Automation*

I. INTRODUCTION

Nowadays, during the rainy season the cultivated crops get affected due to heavy rainfall. This system involves protection of the crops by auto roof which covers the certain area. The rain sensor is activated when there is rainfall and it will give intimation to the controller to close the roof as soon as the rain is detected and also send SMS to the farmer by using GSM. Once rain is stopped, controller automatically opens the roof. This model also comes with manual control mode with SMS. i.e. owner or farmer can open /close the roof manually by sending SMS.

II. OBJECTIVE

The main theme of this project is to prevent the harvested crops from the heavy rain and save the rain water. The rain sensor is used for the working of roof when there is rainfall.

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III. MOTIVATION

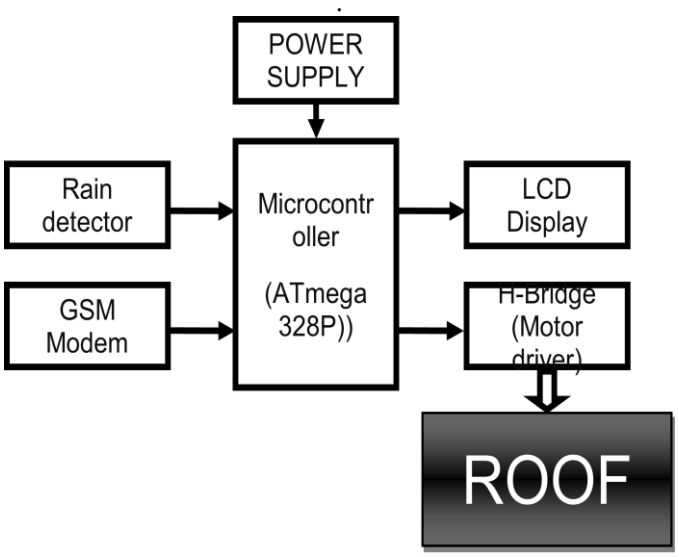
Harvested crops get affected or destroyed during rainy season & water scarcity problem.

IV. WORKING

The rain sensor is activated when there is rainfall and it will gives intimation to the controller. Controller closes the roof as soon as rain is detected, also send a SMS to the farmer by using GSM. Once rain stops the controller automatically opens the roof.

This model also comes with manual control mode with SMS. ie; owner or farmer can open / close the roof manually by sending SMS.

V. BLOCK DIAGRAM



VI. HARDWARE USED

Microcontroller

The prime use of a micro controller is to control the operation of a machine using a fixed program that is stored in ROM and that does not change over the life time of the system. The architecture and instruction set of the micro controller are optimized to handled data in bit and byte size. The areas if applications of micro controllers include control process, manufacturing process, medicine, instrumentation etc. 2. PIC: PIC stands for peripheral interface controller as coined by microchip technology Inc., USA. Microchip is the first manufacturer of 8 pin RISC.

Arduino ATmega328P

Arduino Uno is a microcontroller board based on the ATmega328P . It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16

MHz quartz crystal, a USB connection, a power jack, and a reset button.

Microcontroller	ATmega328P
Operating Voltage	5V
Digital I/O Pins	14
PWM Digital I/O Pins	6
Analog Input Pins	6
Flash Memory (ATmega328P)	32KB
SRAM (ATmega328P)	2KB
EEPROM (ATmega328P)	1KB
Clock Speed	16 MHz
UART	2
SPI	1
I2C	1

DC motor: Motor used here is high quality low cost DC geared motor. It contains Brass gears and steel pinions to ensure longer life and better wear and tear properties. The gears are fixed on hardened steel spindles polished to a mirror finish.

Specifications
length: 46mm / diameter: 36mm
DC supply: 4 to 12V
RPM: 30
Shaft diameter: 6mm
Torque: 5Kg/cm

H-Bridge: IC l293D based dual H-Bridge circuit is used for bi-direction control of DC geared motor. This mechanism open / close the roof.
LED Display: The 16 x 2 intelligent alphanumeric dot matrix displays is capable of displaying 224 different characters and symbols. The Serial LCD Firmware, which allows serial control of the display. The firmware enables microcontrollers to visually output user instructions or readings onto an LCD module. All LCD commands are transmitted serially via a single microcontroller pin. The firmware can also be connected to the serial port of a computer. The LCD display is used to display the information about rain status.
GSM: GSM can control appliances even from long range of distances. A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. The baud rate can be configurable from 9600-115200 bps through AT (Attention) commands.
Rain sensor: A rain sensor or rain switch is a switching device activated by rainfall. There are two main applications for rain sensors. The first is a water conservation device connected to an automatic irrigation system. The second is a device used to protect the interior of an automobile from rain and to support the automatic mode of windscreen wipers.

Power supply unit: This unit converts 230V to 12V/1A. This unit has following functional blocks. step-down transformer (230V AC to 12V AC). rectifier (Sine wave to positive half cycle, filters (converts to pulsating DC), regulators (converts to regulated DC).

VII. FUTURE APPLICATION

- This system can be used for drying clothes.
- This system can be used for protecting vehicles from rain.

VIII. CONCLUSION

Smart automation system against environmental impacts protects vehicles and crops from excess amount of rain water. Using this system eliminates human power and requirement to provide automatic roof mechanism

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[7] M.Ramu1, CH.Rajendra prasad2 M.Tech student, Asst.Prof., SR Engineering college, ECE Dept Anantasagar, A.P1, 2 for International Journal of Advanced Research in Computer and Communication Engineering Vol. 2, Issue 7, July 2013
[8] Prof. Abhijit G Kalbande1, Vrushabh S Golait2, Shubham V Bhadange3 1 Assistant Professor, EXTC Department, PRMCEAM,-Badnera, Amravati. 2,3UG Student, EXTC Department PRMCEAM,-Badnera, Amravati for International Journal of Innovative and Emerging Research in Engineering Volume 4, Issue 4, 2017